Final

Memphis Depot

BRAC Cleanup Team

Meeting Minutes

2005 December 15

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BCT Business/Previous Meeting Minute Approval

The BCT approved and signed the 15 November 2005 meeting minutes.

Dunn Field Source Areas Remedial Design Investigation (RDI)

Mr. Nelson presented preliminary results from the membrane interface probe (MIP) and soil samples collected during the Source Areas RDI in November 2005. He provided figures indicating the completed MIP and soil sample locations for Treatment Areas 1 through 4 on Dunn Field. He also provided figures indicating the extent of the following contaminants in the loess deposits with results above the remedial goals (RGs): Total Volatile Organic Compounds (VOCs), 1,1,2,2-Tetrachloroethane (PCA), Carbon Tetrachloride, Chloroform, Trichloroethene (TCE), and Tetrachloroethene (PCE). Results indicated that the areas with concentrations above RGs are much smaller than the treatment areas identified in the Dunn Field Record of Decision (ROD).

Mr. Ballard commented that locations with MIP results indicated high hits of total VOCs and corresponding soil samples were not collected to meet the data quality objectives (DQOs) of the RDI; therefore, the design must be more conservative, especially for 1,1,2,2-PCA. Mr. Spann asked if additional samples would be collected to confirm the extent of 1,1,2,2-PCA. Mr. Nelson reported that CH2M Hill could collect additional samples during the next field mobilization to refine the boundaries of VOCs, especially 1,1,2,2-PCA, in soil at Treatment Areas 1, 3 and 4.

Mr. Nelson presented a trend graph that indicated the correlation between MIP results and soil sample results was about 50%. The trend graph indicated that 1,1,2,2-PCA had the best correlation between MIP and soil data. Mr. Perlmutter explained that CH2M Hill evaluated the correlation between MIP and soil sample data on an individual basis at each sample location. He went on to explain that CH2M Hill calculated the total VOC mass using MIP and soil sample data. Because the MIP has a maximum detection limit, CH2M Hill reviewed the soil sample results to establish a correction factor to estimate the total VOC mass in the loess. Mr. Perlmutter reported that the bulk of the VOC mass was located in the loess beneath Treatment Areas 1 and 2. Mr. Ballard was pleased to see mass information and indicated EPA liked to see how much contamination had been removed.

Mr. Holmes suggested that the Source Areas RDI Technical Memorandum (TM) include graphical representations of the electron capture detector (ECD), photo ionization detector (PID) and flame ionization detector (FID) responses. Mr. Perlmutter commented that the TM would include how CH2M Hill calculated the VOC mass.

Mr. Nelson presented figures indicating groundwater concentrations from samples collected in August and October 2004 and preliminary data from the November 2005 sampling event that included the newly installed wells. The sampling program goal was to refine the plume boundaries and the conceptual site model. Results indicated levels of some contaminants were higher than anticipated in the new wells.

Mr. Nelson reported that sample results from newly installed well MW177 contained an unanticipated level of PCE that helped explain why recovery well RW4 had historically removed a relatively high mass of VOCs. He also noted that samples results from the wells in the northeast corner of Dunn Field continued to contain PCE from the off-site plume.

Presenting groundwater information for specific contaminants, Mr. Nelson reported that MW173 had a relatively high level of TCE. Mr. Holmes remarked on the interesting flow pattern in that area as RW1A removed a relatively high level of VOCs, yet RW1 always had low levels. Mr. Nelson reported that MW177 had higher concentration of TCE than MW73, which helped explain why RW4 removed extensive levels of TCE. He continued that sample results from MW180, a well location requested by Mr. Ballard, contained levels which correlated with soil and MIP data in Treatment Area 2.

TCE in wells within the Early Implementation of Selected Remedy (EISR) area were slightly decreased showing continued reduction from the zero-valent iron (ZVI) injections. He also pointed out that the sample results from the new wells north of the Memphis Light Gas and Water (MLGW) facility indicated low levels of TCE, and yet they were located north of wells with non-detect results.

In the past, 1,1-Dichloroethene (DCE) was attributed to the off-site plume migrating onto the northeast corner of Dunn Field. Mr. Nelson reported that newly installed well MW181 inside the fence at the north end of Dunn Field contained a low level of 1,1-DCE.

Sample results from newly installed MW173 indicated 1,1,2,2-PCA in the soil was moving down to groundwater. Sample results from newly installed MW177 indicated the plume around MW73 was broader than previously thought. MW77 located west of Dunn Field continued to have high levels of 1,1,2,2-PCA.

Mr. Nelson reported that MW173 was supposed to be up gradient of contamination found in MW15. He recommended installing a few more wells in this area during the next field mobilization, which would probably be for the permeable reactive barrier (PRB) field trial, as MW173 did not meet the DQOs. Mr. Holmes suggested that CH2M Hill include additional monitoring well locations in the RDI TM. Mr. Ballard suggested that the Source Areas Remedial Design (RD) could include recommendations for additional wells with locations based on the MIP data, but Mr. Holmes indicated that MACTEC would rather have the data before reaching the remedial action (RA) stage.

Mr. Nelson reported that there were a few wells with sample results for 1,1,2-TCA that exceeded the RG of 1.9 µg/l. Mr. Nelson indicated he would confirm the maximum contaminant level (MCL) of 5 µg/l shown on the figure, which is higher than the RG.

Groundwater sample results indicated that total VOCs levels were very similar to past concentrations, and Mr. Nelson reported that plume configurations had not changed.

Mr. Nelson presented field/lab geochemical parameters and VOC summary data from the Dunn Field ZVI treatability study area collected during sampling events beginning with the pre-pilot test baseline in October 2003 through November 2005. The contaminant levels had not changed much from last year. Some contaminant levels in specific wells had rebounded, while others continued to reduce. Mr. Nelson reported that concentrations had not rebounded to levels identified during the baseline.

Based on CH2M Hill's evaluation of the RDI data, Mr. Nelson described the alternative potential remedy enhancements to treat the loess and the fluvial deposits. The alternatives for the loess deposit included air injection and soil vapor extraction (SVE), electrical resistive heating (ERH), thermal - in situ thermal desorption (ISTD), in situ stabilization/solidification (S/S), hot spot excavation with ERH, and excavation. The alternative remedy enhancements for the fluvial deposits included ERH and thermal.

Mr. Perlmutter discussed the assumptions used to evaluate the remedy enhancement alternatives and to prepare cost estimates such as the uncertainty of the time frame for certain alternatives to reach the RG and the ability of the alternatives to reach the RG for soil in order to be protective of groundwater.

The team then discussed the proposed land use for the area and the RGs for the contaminants. Mr. Perlmutter reported that as a result of his evaluation of site conditions and information obtained from vendors, CH2M Hill had concluded that it was rather ambitious to reduce TCE and 1,1,2,2-PCA levels in the loess to the RGs of 0.18 mg/kg and 0.011 mg/kg, respectively. The vendors confirmed that with ERH and thermal they would be able to achieve 99.9% reduction, which would still leave levels of TCE and 1,1,2,2-PCA above the RGs. Mr. Perlmutter noted that a remedy needed to achieve 99.9994% reduction in order to meet the RGs, and that he had

evaluated excavation of hot spots in areas where meeting the RGs would be problematic due to high levels in soil.

Mr. Nelson also presented potential groundwater remedies that included ZVI injection within the 100 µg/l contour, ZVI injection within soil source areas (areas above RGs), ZVI injection and bioremediation within the dissolved plume, strategic ZVI injections with no bioremediation, and monitoring only (PRB capture). He presented and the team discussed the assumptions such as the number of injection points and monitoring used to evaluate alternatives and to prepare cost estimates.

The team's preferred alternatives for soil were thermal enhancement for the loess deposits and SVE for the fluvial deposits. The team's preferred alternatives for groundwater were strategic ZVI injections.

The team asked if using the thermal enhancement all the way to groundwater would be more efficient and cost effective then injecting ZVI. Mr. Perlmutter responded that the cost of heating up the groundwater was higher than the cost of injecting ZVI. CH2M Hill will review the cost and expected effectiveness for ZVI injection versus thermal remedies for groundwater.

Mr. Spann asked about the need to reduce oxygen-reduction potential (ORP) with bioremediation to enhance longevity of the ZVI. Mr. Nelson indicated that the vendors he spoke with had no data to indicate that lower ORP provided longer viability of ZVI. He brought up the TM written by Mr. Perlmutter that addressed Mr. Spann's comments on the EISR regarding ORP and also included information on ZVI grain size. Mr. Ballard interjected that he had discussed the ORP issue with Dr. Ralph Ludwig who indicated that there was no data to support the thought that reducing oxygen in groundwater would increase ZVI longevity.

Mr. Ballard indicated that the alternatives presented were not inconsistent with the Dunn Field ROD. The ROD indicated that the Source Area groundwater, which EPA considered to be at dense non-aqueous phase liquid (DNAPL) levels, would be treated with ZVI. The only inconsistencies with the ROD were the sizes of the treatment areas. He then asked how CH2M Hill would define the treatment points for ZVI. Mr. Nelson responded that CH2M Hill would look at the higher concentration areas such as around MW10, MW73, MW177 and MW 173.

Mr. Nelson then asked if the team could re-evaluate the RG for 1,1,2,2-PCA as it appeared to be unattainable using available technologies. He indicated that the RG could be obtained but that it would dramatically increase the cost of the RA. He suggested re-evaluating the need to reduce on-site soil levels to the RGs since the selected remedies would effectively reduce levels in the loess on-site and the down gradient PRB would treat the off-site groundwater.

Mr. Perlmutter indicated that the RGs for soils to be protective of groundwater were developed by dilution attenuation factors (DAF). Given that the team had collected a lot more data, he suggested re-evaluating the DAF. Mr. Ballard opined that changing the RG as part of the Source Areas RD would require a ROD amendment with the associated the public comment process, which could potentially delay the final RD by two years.

The team discussed how best to proceed given the uncertainty of attaining the RGs for TCE and 1,1,2,2-PCA in soils. Mr. Holmes questioned whether the team should stop the process now, or continue with the RD and then during construction of the remedy identify that the remedy would not meet the RG because now the DAF was different based on sample results. Mr. Ballard

indicated that EPA guidance allows the RG to change if site specific conditions are identified during RA construction or subsequent operations that would cause the RG to change.

Mr. Dobbs was concerned about spending millions on a remedy that would not reach the RGs. Mr. Miller indicated that the RG issue would not change the RA capital investment, but would change how long the RA operated. Mr. Ballard pointed out that the bottom line would be attaining the remedial action objectives (RAOs) for soils – to protect groundwater. Therefore, if strong technical data collected while the design moved forward brought about a significant difference in the DAF, there would probably be no change to what was constructed just how long it would operate.

Mr. Dobbs brought up future reuse of this portion of Dunn Field and questioned whether it would be cost effective to cap the area. He opined that while the remedy must be protective of the environment and human health, it must also be cost effective to taxpayers. Mr. Ballard responded that with a cap comes monitoring of the cap condition and that EPA looked at protectiveness and as well as cost effectiveness.

Mr. Spann questioned at what point after RA construction and operation would EPA and TDEC determine that perhaps the RGs for soils were too conservative and provide concurrence with the Final Closeout Report. At what point do the regulators agree that RAOs have been met even if the soil levels have not achieved RGs. Mr. Ballard indicated that meeting the RAOs trumped meeting the RGs. He continued that if during the RA operation new soil data indicated a higher DAF, which translated to a more achievable RG, then DLA could amend the ROD based on the new information. If the new numbers were still unachievable, then the team could still change the remedy to include another element such as cleaning up the loess to a certain level then cap or excavate the hot spots.

The team's number one problem was to determine if new data indicated that the RGs were necessary to meet the RAOs. Also, given the new data was the site specific DAF different, and what would a new DAF do to the RG?

AI: CH2M Hill will review the cost and expected effectiveness for ZVI injection versus thermal remedies for groundwater.

AI: While moving forward with the Source Areas RD, CH2M Hill will evaluate the site specific DAF and RG for soils to be protective of groundwater.

Offsite Plume – Northeast corner of Dunn Field

Mr. Spann reported that the EPA contractor had installed four monitoring wells and had hit clay at different depths indicating a fairly steep slope. Contractors collected groundwater samples, but had not received sample results. Mr. Spann indicated that TDEC had discussed with EPA that this would be a multi-phased investigation.

Next Meeting

The BCT confirmed the next meeting would be on 19 January 2006 at the CH2M Hill office in Atlanta, GA, with the project team meeting the afternoon of 18 January 2006. The BCT also confirmed additional risk communication training would be conducted on 14 - 15 February 2006 with the location to be determined.

SIGNED 1/19/06
MICHAEL DOBBS DATE
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TURPIN BALLARD DATE
Environmental Protection Agency
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